

Abstract

An arrangement and process are provided for regulating the humidification or dew point of inlet air supplied (124, 224, 324, 424) to combustion-supported reaction means (20, 120) of a fuel processing system in a fuel cell power plant (110, 210, 310, 410). In addition to flowing exhaust gas(es) (28, 128) in heat and energy exchange relation with inlet air through a primary energy recovery device (ERD) (30) of the gas/gas type, a supplemental ERD (50) of the gas/liquid (water) type uses water temperature to passively condense moisture from a gas stream, either of inlet air or of exhaust gas, to regulate the dew point of the air supplied to the combustion-supported reaction means (20, 120). The supplemental ERD (50) may have a gas channel (134) and a water channel (132) separated by an enthalpy exchange barrier (136), and may be relatively upstream or downstream of the primary ERD (30) relative to the flow of inlet air through the latter to regulate dew point indirectly or directly, respectively.